APPENDIX A SUPPORTING CALCULATIONS

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TABLE A-1
CALCULATION OF MEDIA CONCENTRATIONS AT THE LOCATION OF MAXIMUM WET DEPOSITION WITHIN THE INDUSTRIAL ZONE AND ASSUMING A SOIL MIXING DEPTH OF 1 CM

Soil Concentration due to Deposition

Soil Concentration Average over Exposure Duration

| COC | Ds | tD | Cs _{tD} | ks | Cs (T ₂ <td)< th=""></td)<> |
|------|-----|----|------------------|-------|--|
| Lead | 3.1 | 20 | 40 | 0.046 | 77.3 |

| Variable | Decryption | Units | Value |
|----------|--|------------------|---------------|
| | | mg COC/kg | |
| Ds | Deposition Term | soil-yr | site-specific |
| - | time period over which deposition occurs (time | | |
| tD | period of combustion) | yr | 20_ |
| ks | COC soil loss constant due to all proceses | yr ⁻¹ | site-specific |

Highest Annual Average Soil Concentration

| Q | Zs | BD | Fv | Vdv | Cyv | Dywv | Dydρ | Dywp | Ds |
|--------|----|-----|----|-----|-----|------|------|------|-----|
| 0.0756 | 11 | 1.5 | 0 | 3 | 0 | 0 | 0 | 0.61 | 3.1 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-----------------------|---------------|---------------|
| | COC-specific emission | 1 | | |
| a | rate | g/s | site-specific | |
| Zs | Soil mixing zone depth | cm | 1 | |
| | | g soil/cm3 | | |
| BD | Soil bulk density | soil | 1.5 | default |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| Vdv | Dry deposition velocity | cm/s | 3 | |
| | Unitized yearly average | 1 | constituent- | |
| | air concentration from | | and site- | |
| Суν | vapor phase | μg-s/g-m ³ | specific | air modeling |
| | Unitized yearly average | - | constituent- | |
| | wet deposition from | _ | and site- | |
| Dywv | vapor phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | dry deposition from | 1 | and site- | |
| Dydp | particle phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | det deposition from | 1 . | and site- | |
| Dywp | particle phase | s/m²-yr | specific | air modeling |

COC Soil Loss Constant

| ksg | kse | ksr | ksl | ksv | ks |
|-----|-----|-------|--------|-----|-------|
| 0 | 0 | 0.037 | 0.0089 | 0 | 0.046 |

| Variable | Description | Units | Value | |
|----------|---|------------------|---------------------------------------|--|
| ksg | COC loss constant due to biotic and abiotic degradation | yr-1 | constituent- specific | |
| kse | COC loss constant due | yr ⁻¹ | 0 | Default value because of soil eroding onto the Site and away from the Site |
| ksr | COC loss constant due to runoff | yr ⁻¹ | Site-specific | |
| ksl | COC loss constant due to leaching | yr-1 | constituent- and Site- specific | |
| ksv | COC loss due to volatilization | yr-1 | 0 | |

COC Loss Constant due to Runoff

| RO | sw | Zs | Kds | BD | ksr |
|----|-----|----|-----|-----|-------|
| 50 | 0.2 | 1 | 900 | 1.5 | 0.037 |

| Variable | Description | Units | Value | |
|----------|---|-----------------------------------|--------------------------|----------|
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| sw | Soil volumetric water content | mL water/ cm ³ soil | 0.2 | Idefault |
| Zs | Soil mixing zone depth | cm | 1 | |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |
| BD | Soil bulk density | g soil/cm ³ soil | 1.5 | default |

COC Loss Constant due to Leaching

| Р | | RO | Ev | sw | Zs | BD | Kds | ksi |
|-----|-----|----|----|-----|----|-----|-----|--------|
| 102 | 9.5 | 51 | 48 | 0.2 | 1 | 1.5 | 900 | 0.0089 |

| Variable | Description | Units | Value | |
|----------|---|--------------------------------|--------------------------|---------------------------|
| P | average annual precipitation | cm/yr | 18.06 to 164.19 | 102 - local conditions |
| l . | Average annual irrigation | cm/yr | 1 to 100 | |
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| Ev | Average annual evapotranspiration | cm/yr | 35 to 100 | 48 - local conditions |
| sw | Soil volumetric water content | mL water/ cm3 soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 1 | |
| BD | Soil bulk density | g soil/cm ³ soil | 1,5 | default |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |

Air Concentration

| Q | Fv | Cyv | Сур | Ca |
|--------|----|-----|-----|-------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Q | Fv | Chv | Chp | Cacute |
|--------|----|-----|-----|--------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-----------------------|------------------|---------------|
| | COC-specific emission | | | |
| Q | rate | g/s | site-specific | |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| | Unitized yearly average | | | |
| | air concentration from | | constituent- and | |
| Cyv | vapor phase | µg-s/g-m³ | site-specific | air modeling |
| | Unitized yearly average | | | |
| Ì | air concentration from | | constituent- and | |
| Сур | particle phase | s/m²-yr | site-specific | air modeling |
| • | Unitized hourly average | | | |
| : | air concentration from | | constituent- and | |
| Chv | vapor phase | μg-s/g-m ³ | site-specific | air modeling |
| İ | Unitized hourly average | | | |
| | air concentration from | | constituent- and | |
| Chp | particle phase | s/m²-yr | site-specific | air modeling |

TABLE A-2
CALCULATION OF MEDIA CONCENTRATIONS AT THE LOCATION OF MAXIMUM WET DEPOSITION WITHIN THE RESIDENTIAL/AGRICULTURAL ZONE ASSUMING A 1 CM SOIL MIXING DEPTH

Soil Concentration due to Deposition

Soil Concentration Average over Exposure Duration

| coc | Ds | tD | Cs _{tD} | ks | Cs (T ₂ <td)< th=""></td)<> |
|------|-----|----|------------------|-------|--|
| Lead | 1.5 | 20 | 20 | 0.046 | 64.1 |
| | | | | | |

| Variable | Decryption | Units | Value |
|----------|--|-------------------------|---------------|
| Ds | Deposition Term | mg COC/kg soil-yr | site-specific |
| tD | time period over which deposition occurs (time period of combustion) | yr | 20 |
| ks | COC soil loss constant due to all proceses | yr ⁻¹ | site-specific |

Highest Annual Average Soil Concentration

| Q | Zs | BD | Fv | Vdv | Cyv | Dywv | Dydp | Dywp | Ds |
|--------|----|-----|----|-----|-----|------|------|------|------|
| 0.0756 | 1 | 1.5 | 0 | 3 | 0 | 0 | 0 | 0.30 | 1.53 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|------------|---------------|---------------|
| | COC-specific emission | ì | | |
| Q | rate | g/s | site-specific | |
| Zs | Soil mixing zone depth | cm | 1 | |
| | | g soil/cm3 | | |
| BD | Soil bulk density | soil | 1.5 | default |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fv | phase | unitiess | specific | 0% for metals |
| Vdv | Dry deposition velocity | cm/s | 3 | |
| | Unitized yearly average | | constituent- | |
| | air concentration from | 1 | and site- | |
| Cyv | vapor phase | μg-s/g-m³ | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | wet deposition from | | and site- | |
| Dywv | vapor phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | dry deposition from | | and site- | |
| Dydp | particle phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | det deposition from | | and site- | |
| Dywp | particle phase | s/m²-yr | specific | air modeling |

COC Soil Loss Constant

| ksg | kse | ksr | ksl | ksv | ks |
|-----|-----|-------|--------|-----|-------|
| 0 | 0 | 0.037 | 0.0089 | 0 | 0.046 |

| Variable | Description | Units | Value | |
|----------|---|------------------|---------------------------------------|--|
| ksg | COC loss constant due to biotic and abiotic degradation | yr ⁻¹ | constituent- | |
| kse | COC loss constant due to soil erosion | yr-1 | 0 | Default value because of soil eroding onto the Site and away from the Site |
| ksr | COC loss constant due to runoff | yr-¹ | Site-specific | |
| ksi | COC loss constant due to leaching | yr-1 | constituent- and Site- specific | |
| ksv | COC loss due to volatilization | yr ⁻¹ | 0 | |

COC Loss Constant due to Runoff

| RO | sw | Zs | Kds | BD | ksr |
|----|-----|----|-----|-----|-------|
| 50 | 0.2 | 1 | 900 | 1.5 | 0.037 |

| Variable | Description | Units | Value | |
|----------|---|-----------------------|--------------------------|----------|
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| sw | Soil volumetric water content | mL water/ cm3 soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 1 | |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 9.00E+02 |
| BD | Soil bulk density | g soil/cm³ soil | 1.5 | default |

COC Loss Constant due to Leaching

| Р | | RO | Ev | sw | Zs | BD | Kds | ksl |
|-------|-----|------|----|-----|----|-----|-----|--------|
| 101.6 | 9.5 | 50.8 | 48 | 0.2 | 1 | 1.5 | 900 | 0.0089 |

| Variable_ | Description | Units | Value | |
|-----------|--|-----------------------|---------------|-----------------------|
| | average annual | | 18.06 to | 108 - local |
| P | precipitation | cm/yr | 164.19 | conditions |
| ı | Average annual irrigation | cm/yr | 1 to 100 | |
| | Average annual surface runoff from previous | | | |
| RO | areas | cm/yr | Site-specific | |
| Ev | Average annual evapotranspiration | cm/yr | 35 to 100 | 48 - local conditions |
| sw | Soil volumetric water content | mL water/ cm3 soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 1 | deladit |
| | | g soil/cm3 | | |
| BD_ | Soil bulk density | soil | 1.5 | default |
| | Soil-water partition | mL water/ | constituent- | |
| Kds | coefficient | g soil | specific | 900 |

Air Concentration

| Q | Fv | Cyv | Сур | Ca |
|--------|----|-----|-----|-------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Q | Fv | Chv | Chp | Cacute |
|--------|----|-----|-----|--------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Variable | Decription | Units | Value | |
|----------------|-------------------------|-----------------------|------------------|---------------|
| | COC-specific emission | | | |
| Q | rate | g/s | site-specific | |
| - - | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fν | phase | unitless | specific | 0% for metals |
| | Unitized yearly average | | , <u> </u> | |
| | air concentration from | | constituent- and | |
| Суу | vapor phase | μg-s/g-m ³ | site-specific | air modeling |
| | Unitized yearly average | | | |
| | air concentration from | | constituent- and | |
| Сур | particle phase | s/m²-yr | site-specific | air modeling |
| | Unitized hourly average | | | * |
| | air concentration from | | constituent- and | |
| Chv | vapor phase | ug-s/g-m³ | site-specific | air modeling |
| | Unitized hourly average | | | _ |
| ļ | air concentration from | _ | constituent- and | |
| Chp | particle phase | s/m²-yr | site-specific | air modeling |

TABLE A-3
CALCULATION OF MEDIA CONCENTRATION AT THE LOCATION OF MAXIMUM WET DEPOSITION WITHIN THE RESIDENTIAL/AGRICULTURAL ZONE AND ASSUMING A SOIL MIXING DEPTH OF 20 CM

Soil Concentration due to Deposition

Soil Concentration Average over Exposure Duration

| coc | Ds | tD | Cs _{tD} | ks | Cs (T ₂ <td)< th=""></td)<> |
|------|-------|----|------------------|--------|--|
| Lead | 0.076 | 20 | 1.5 | 0.0023 | 53.4 |
| | | | | | |

| Variable | Decryption | Units | Value |
|----------|--|----------------------|---------------|
| Ds | Deposition Term | mg COC/kg soil-yr | site-specific |
| tD | time period over which deposition occurs (time period of combustion) | yr | 20 |
| ks | COC soil loss constant due to all proceses | yr ⁻¹ | site-specific |

Highest Annual Average Soil Concentration

| Q | Zs | BD | Fv | Vdv | Cyv | Dywv | Dydp | Dywp | Ds |
|--------|----|-----|----|-----|-----|------|------|------|-------|
| 0.0756 | 20 | 1.5 | 0 | 3 | 0 | 0 | 0 | 0.30 | 0.076 |

| Variable | Decription | Units | Value | · · · · |
|---------------|-------------------------|------------------------|---------------|---------------|
| | COC-specific emission | | | |
| Q . | rate | g/s | site-specific | Ì |
| Zs | Soil mixing zone depth | cm | 20 | |
| | | g soil/cm ³ | | |
| BD | Soil bulk density | soil | 1,5 | default |
| | Fraction of COC air | | | |
| | concentration in vapor | 1 | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| Vdv | Dry deposition velocity | cm/s | 3 | - |
| | Unitized yearly average | [| constituent- | |
| | air concentration from | _ | and site- | |
| Cyv | vapor phase | μg-s/g-m ³ | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | wet deposition from | | and site- | |
| D <u>y</u> wv | vapor phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | dry deposition from | _ | and site- | |
| Dydp | particle phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | det deposition from | 1 | and site- | |
| Dywp | particle phase | s/m²-yr | specific | air modeling |

COC Soil Loss Constant

| ksg | kse | ksr | ksi | ksv | ks |
|-----|-----|--------|---------|-----|--------|
| 0 | 0 | 0.0019 | 0.00045 | 0 | 0.0023 |

| Variable | Description | Units | Value | |
|----------|---|------------------|---------------------------------------|--|
| ksg | COC loss constant due to biotic and abiotic degradation | yr-1 | constituent- | |
| kse | COC loss constant due | yr ⁻¹ | 0 | Default value because of soil eroding onto the Site and away from the Site |
| ksr | COC loss constant due to runoff | yr ⁻¹ | Site-specific | |
| ksl | COC loss constant due to leaching | yr ⁻¹ | constituent- and Site- specific | |
| ksv | COC loss due to volatilization | yr ⁻¹ | 0 | |

COC Loss Constant due to Runoff

| RO | sw | Zs | Kds | BD | ksr |
|----|-----|----|-----|-----|--------|
| 50 | 0.2 | 20 | 900 | 1.5 | 0.0019 |

| Variable | Description | Units | Value | |
|----------|---|-----------------------------------|--------------------------|---------|
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| sw | Soil volumetric water content | mL water/ cm ³ soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 20 | |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |
| BD | Soil bulk density | g soil/cm³ soil | 1.5 | default |

COC Loss Constant due to Leaching

| Р | ı | RO | Ev | sw | Zs | BD | Kds | ksl |
|-------|-----|----|----|-----|----|-----|-----|---------|
| 101.6 | 9.5 | 51 | 48 | 0.2 | 20 | 1.5 | 900 | 0.00045 |

| Variable | Description | Units | Value | |
|----------|---|--------------------------------|--------------------------|-----------------------|
| | average annual | | 18.06 to | 108 - local |
| Ρ. | precipitation | cm/yr | 164.19 | conditions |
| 1 | Average annual irrigation | cm/yr | 1 to 100 | |
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| Ev | Average annual evapotranspiration | cm/yr | 35 to 100 | 48 - local conditions |
| sw | Soil volumetric water content | mL water/ cm³ soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 20 | |
| BD | Soil bulk density | g soil/cm ³ soil | 1.5 | default |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |

Aboveground Produce Concentration due to Direct Deposition

| Q | Fv | Dydp | Fw | Dywp | Rp | kp | Тр | Yp | Pd |
|--------|----|------|------|------|------|----|------|-----|------|
| 0.0756 | 0 | 0 | 0.60 | 0.30 | 0.39 | 18 | 0.16 | 2.2 | 0.13 |

| Variable | Description | Units | Value | T |
|-----------|--------------------------------|------------------|---------------|-------------------|
| Variable | | | 1 | <u> </u> |
| └ | COC-specific emission rate | g/s | site-specific | |
| | Fraction of COC air | | 00004141004 | |
| Fv | | : | constituent- | 00/ 5 |
| <u> </u> | concentration in vapor phase | unitless | specific | 0% for metals |
| | Unitized yearly average dry | | constituent- | |
| <u> </u> | deposition from particle | | and site- | |
| Dydp | phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average det | | constituent- | |
| | deposition from particle | _ | and site- | İ |
| Dywp | phase | s/m²-yr | specific | air modeling |
| | Interception fraction of the | | | |
| Rp | edible portion of plant | unitless | 0.39 | default |
| _ | Fraction of COC wet | | | |
| ľ | deposition that adheres to | | | value for cations |
| Fw | plant surfaces | unitless | 0.6 | and most organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| KP | Length of plant exposure to | y1 | 10 | Tecontinended |
| | deposition per harvest of | | | |
| T., | edible portion of plant | d | 0.164 | |
| Тр | legible portion of plant | yr-1 | 0.164 | recommended |
| | Yield or standing crop | | | recommended |
| 1 | biomass of the edible portion | | | value for above |
| V- | of the plant (productivity) | kg DW/m² | 2.24 | 1 |
| Yp | or the plant (productivity) | Kg DVV/III | 2.24 | ground produce |

Aboveground Produce Concentration Due to Air-to-Plant Transfer

| Q | Fv | Суν | Bv _{ag} | Vg _{ag} | а | Pv |
|--------|----|-----|------------------|------------------|------|----|
| 0.0756 | 0 | 0 | 0 | 1 | 1200 | 0 |

| Variable | Decription | Units | Value | |
|------------------|---|-----------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| ·Fv | Fraction of COC air concentration in vapor phase | unitless | constituent- specific | 0% for metals |
| Cyv | Unitized yearly average air concentration from vapor phase | μg-s/g-m³ | constituent- and site- specific | air modeling |
| Bv _{ag} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- specific | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m³ | 1200 | |

Aboveground Produce Concentration due to Root Uptake

| Cs | Br _{ag} | Pr _{ag} |
|----|------------------|------------------|
| 53 | 1.36E-02 | 0.73 |

| Variable | Decription | Units | Value | |
|------------------|---|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | · |
| Br _{ag} | factor for aboveground produce | unitless | constituent- specific | 1.36E-02 |

Belowground Produce Concentration due to Root Uptake

| Cs | Br _{roolveg} | $VG_{rootveg}$ | Pr _{bg} |
|----|-----------------------|----------------|------------------|
| 53 | 9.00E-03 | 1 | 4.81E-01 |

| Variable | Decription | Units | Value | |
|-----------------------|--|-----------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg | consituent- and site- specific | |
| Br _{rootveg} | Plant-soil bioconcentration factor for belowground produce | unitless | constituent- specific | 9.00E-03 |
| VG _{rootveg} | Empirical correction factor for belowground produce | unitless | 0.1 or 1 | 1 |

Forage and Silage Concentration due to Direct Deposition

| Q | Fv | Dydp | Fw | | Rp | kp | Тр | Yp | Pd (mg COC/ kg DW) |
|--------|----|------|-----|-------|------|----|------|-----|-----------------------|
| 0.0756 | 0 | 0 | 0.6 | 0.303 | 0.39 | 18 | 0.16 | 2.2 | 0.13 |

| Variable | Description | Units | Value | |
|----------|--------------------------------|----------------------|---------------|-----------------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| | Fraction of COC air | | constituent- | |
| Fv | concentration in vapor phase | unitless | specific | 0% for metals |
| | Unitized yearly average dry | U , U | constituent- | 0 70 101 metals |
| | deposition from particle | | and site- | ļ |
| Dydp | phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average det | | constituent- | |
| | deposition from particle | • | and site- | |
| Dywp | phase | s/m²-yr | specific | air modeling |
| | Interception fraction of the | | | |
| Rp | edible portion of plant | unitless | 0.39 | default |
| | Fraction of COC wet | | I | |
| | deposition that adheres to | | | value for cations and |
| Fw | plant surfaces | unitless | 0.6 | most organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| | Length of plant exposure to | | | |
| | deposition per harvest of | | | |
| Тр | edible portion of plant | yr-1 | 0.164 | recommended |
| | Yield or standing crop | | | |
| | biomass of the edible portion | | | recommended value for |
| Yp | of the plant (productivity) | kg DW/m ² | 2.24 | above ground produce |

Forage and Silage Concentrations Due to Air-to-Plant Transfer

| Q | Fv | Cyv | Bv _{forage} | Vg _{ag} | а | Pv |
|--------|----|-----|----------------------|------------------|------|----|
| 0.0756 | 0 | 0 | 0 | 1 | 1200 | 0 |

| Variable | Description | Units | Value | |
|----------------------|---|-----------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| Fv | Fraction of COC air concentration in vapor phase | unitless_ | constituent- specific | 0% for metals |
| Cyv | Unitized yearly average air concentration from vapor phase | μg-s/g-m³ | constituent- and site- specific | air modeling |
| Bv _{forage} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m² | 1200 | |

Forage and Silage Concentrations due to Root Uptake

| Cs | Br _{forage} | Pr |
|----------|----------------------|----------|
| 53.41118 | 4.50E-02 | 2.40E+00 |

| Variable | Description | Units | Value | |
|----------------------|--|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Br _{forage} | Plant-soil bioconcentration factor for aboveground produce | unitless | constituent- specific | 4.50E-02 |

Beef Concentration due to Plant and Soil Ingestion

| | F | Qp | Р | Qs | Cs | Bs | Ba _{beef} | MF | A _{beef} |
|-----------------|--------|-------------|-------------|-----|----|----|--------------------|----|-------------------|
| forage | 1 | 8.8 | 2.5 | | | | | | |
| silage grain | 1 1 | 2.5 0.48 | 2.5 0.85 | 0.5 | 53 | 1 | 3.00E-04 | 1 | 0.02 |
| grain | 1 — | 0.48 | | | | | | | |

| Variable | Description | Units | Value | |
|--------------------|---|---------------------|---|--|
| F | Fration of plant type grown on contaminated soil and ingested by the animal | unitless | 1 | assumed unless site- specific information is available |
| Qρ | Quantity of plant type ingested by the animal per day | kg DW plant/day | Site- and plant-specific | |
| Р | Concetration of COC in plant type ingested by the animal | mg/kg DW | constituent- site- and plant specific | |
| Qs | Quantity of soil ingested by the animal | kg/day | 0.5 | recommended |
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Bs | Soil bioavailability factor | unitless | 1 | recommended |
| Ba _{beef} | Biotransfer factor for beef | day/kg FW tissue | constituent- specific | 3.00E-04 |
| MF | Metabolism factor | unitless | constituent- specific | . 1 |

Air Concentration

| Q | Fv | Cyv | Сур | Ca |
|--------|----|-----|-----|-------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Q | Fv | Chv | Chp | Cacute |
|--------|----|-----|-----|--------|
| 0.0756 | 0 | 0 | 0 | 0.000 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-----------------------|------------------|---------------|
| | COC-specific emission | | | |
| Q | rate | g/s | site-specific | |
| | Fraction of COC air | | | |
| | concentration in vapor | i | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| | Unitized yearly average | T | | |
| | air concentration from | | constituent- and | |
| Cyv | vapor phase | µg-s/g-m³ | site-specific | air modeling |
| | Unitized yearly average |] | | |
| | air concentration from | l . | constituent- and | |
| Сур | particle phase | s/m²-yr | site-specific | air modeling |
| | Unitized hourly average | <u> </u> | | _ |
| | air concentration from | | constituent- and | |
| Chv | vapor phase | μg-s/g-m ³ | site-specific | air modeling |
| | Unitized hourly average | | | |
| | air concentration from | | constituent- and | |
| Chp | particle phase | s/m²-yr | site-specific | air modeling |

TABLE A-4
CALCULATION OF MEDIA CONCENTRATIONS AT THE LOCATION OF MAXIMUM DRY DEPOSITION WITHIN THE RESIDENTIAL/AGRICULTURAL ZONE ASSUMING A SOIL MIXING DEPTH OF 1 CM

Soil Concentration due to Deposition

Soil Concentration Average over Exposure Duration

| coc | Ds | tD | Cs _{tD} | ks | Cs (T ₂ <td)< th=""></td)<> |
|------|-----|----|------------------|-------|--|
| Lead | 1.8 | 20 | 23 | 0.046 | 66.1 |

| Variable | Decryption | Units | Value |
|----------|--|-------------------------|---------------|
| Ds | Deposition Term | mg COC/kg soil-yr | site-specific |
| tD | time period over which deposition occurs (time period of combustion) | уг | 20 |
| ks | COC soil loss constant due to all proceses | yr ⁻¹ | site-specific |

Highest Annual Average Soil Concentration

| Q | Zs | BD | Fv | Vdv | Cyv | Dywv | Dydp | Dywp | Ds |
|--------|----|-----|----|-----|-----|------|------|-------|-----|
| 0.0756 | 11 | 1.5 | 0 | 3 | 0 | 0 | 0.33 | 0.017 | 1.8 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|------------|---------------|---------------|
| | COC-specific emission | 1 | | |
| Q | rate | g/s | site-specific | |
| Zş | Soil mixing zone depth | cm | 1 | · |
| | | g soil/cm3 | | |
| BD | Soil bulk density | soil | 1.5 | default |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| Vdv | Dry deposition velocity | cm/s | 3 | |
| | Unitized yearly average | | constituent- | |
| | air concentration from | | and site- | |
| Суν | vapor phase | µg-s/g-m³ | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | wet deposition from | | and site- | |
| Dywv | vapor phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | dry deposition from | _ | and site- | |
| Dydp | particle phase | s/m²-yr | specific | air modeling |
| • | Unitized yearly average | | constituent- | |
| | det deposition from | | and site- | |
| Dywp | particle phase | s/m²-yr | specific | air modeling |

COC Soll Loss Constant

| ksg | kse | ksr | ksi | ksv | ks |
|-----|-----|-------|--------|-----|-------|
| 0 | 0 | 0.037 | 0.0089 | 0 | 0.046 |

| Variable | Description | Units | Value | |
|----------|---|------------------|---------------------------------------|--|
| ksg | COC loss constant due to biotic and abiotic degradation | yr-1 | constituent- specific | |
| kse | COC loss constant due to soil erosion | yr ⁻¹ | 0 | Default value because of soil eroding onto the Site and away from the Site |
| ksr | COC loss constant due to runoff | yr-1 | Site-specific | |
| ksl | COC loss constant due to leaching | yr-1 | constituent- and Site- specific | |
| ksv | COC loss due to volatilization | yr ⁻¹ | 0 | |

COC Loss Constant due to Runoff

| RO | sw | Zs | Kds | BD | ksr |
|----|-----|----|-----|-----|-------|
| 50 | 0.2 | 1 | 900 | 1.5 | 0.037 |

| Variable | Description | Units | Value | |
|----------|---|--------------------------------|--------------------------|---------|
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| sw | Soil volumetric water content | mL water/ cm³ soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 1 | |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |
| BD | Soil bulk density | g soil/cm ³ soil | 1.5 | default |

COC Loss Constant due to Leaching

| Р | | RO | Ev | sw | Zs | BD | Kds | ksl |
|-----|-----|----|----|-----|----|-----|-----|--------|
| 102 | 9.5 | 51 | 48 | 0.2 | 1 | 1.5 | 900 | 0.0089 |

| Variable | Description | Units | Value | |
|----------|--|--------------------------------|--------------------------|-----------------------|
| | average annual | | 18.06 to | 108 - local |
| Δ. | precipitation | cm/yr | 164.19 | conditions |
| | Average annual irrigation | cm/yr | 1 to 100 | |
| | Average annual surface runoff from previous | | | |
| RO | areas | cm/yr | Site-specific | 1 |
| E۷ | Average annual evapotranspiration | cm/yr | 35 to 100 | 48 - local conditions |
| sw | Soil volumetric water content | mL water/ cm3 soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 1 | |
| BD | Soil bulk density | g soil/cm ³ soil | 1.5 | default |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |

Aboveground Produce Concentration due to Direct Deposition

| Q | Fv | Dydp | Fw | Dywp | Rp | kp | Тр | Yp | Pd |
|--------|----|------|-----|-------|------|----|------|-----|----|
| 0.0756 | 0 | 0.33 | 0.6 | 0.017 | 0.39 | 18 | 0.16 | 2.2 | o |

| Variable | Description | Units | Value | |
|------------|--------------------------------|--------------------------|---------------|-------------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| | | | | |
| <u> </u> _ | Fraction of COC air | | constituent- | |
| Fv | concentration in vapor phase | unitless | specific | 0% for metals |
| | Unitized yearly average dry | | constituent- | |
| | deposition from particle | , | and site- | |
| Dydp | phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average det | | constituent- | |
| | deposition from particle | _ | and site- | |
| Dywp | phase | s/m²-yr | specific | air modeling |
| | Interception fraction of the | | | |
| Rp | edible portion of plant | unitless | 0.39 | default |
| | Fraction of COC wet | | | |
| | deposition that adheres to | | ŀ | value for cations |
| Fw | plant surfaces | unitless | 0.6 | and most organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| | Length of plant exposure to | , | | |
| | deposition per harvest of | | | |
| Тр | edible portion of plant | yr-1 | 0.164 | recommended |
| İ | Yield or standing crop | | | recommended |
| | - · | | | value for above |
| | biomass of the edible portion | Icm DVALLES ² | 224 | |
| Υp | of the plant (productivity) | kg DW/m² | 2.24 | ground produce |

Aboveground Produce Concentration Due to Air-to-Plant Transfer

| Q | Fv | Cyv | Bv _{ag} | Vg_{ag} | а | Pv |
|--------|----|-----|------------------|-----------|------|----|
| 0.0756 | 0 | 0 | 0 | . 1 | 1200 | 0 |

| Variable | Decription | Units | Value | |
|------------------|---|-----------------------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| Fv | Fraction of COC air concentration in vapor phase | unitless | constituent- specific | 0% for metals |
| Суу | Unitized yearly average air concentration from vapor phase | μg-s/g-m ³ | constituent- and site- specific | air modeling |
| Bv _{ag} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- specific | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m³ | 1200 | |

Aboveground Produce Concentration due to Root Uptake

| Cs | Br _{ag} | Prag |
|----|------------------|----------|
| 66 | 1.36E-02 | 8.99E-01 |

| Variable | Decription | Units | Value | |
|------------------|--|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Br _{ag} | Plant-soil bioconcentration factor for aboveground produce | unitless | constituent- specific | 1.36E-02 |

Belowground Produce Concentration due to Root Uptake

| Cs | Br _{rootveg} | VG _{rootveg} | Pr _{bg} | |
|----|-----------------------|-----------------------|------------------|--|
| 66 | 9.00E-03 | 1 | 5.95E-01 | |

| Variable | Decription | Units | Value | |
|-----------------------|--|-----------|--------------|----------|
| | | | consituent- | |
| | Average soil concentration | mg COC/kg | and site- | |
| Cs | over exposure duration | soil | specific | |
| | Plant-soil bioconcentration | | | |
| ŀ | factor for belowground | | constituent- | |
| Br _{rootveg} | produce | unitless | specific | 9.00E-03 |
| | Empirical correction factor for belowground produce | unitless | 0.1 or 1 | 4 |
| VG _{rootveg} | ioi belowground produce | umuess | 0.1011 | 1 |

Forage and Silage Concentration due to Direct Deposition

| Q | Fv | Dydp | Fw | Dywp | Rp | kp | Тр | Yp | Pd (mg COC/ kg DW) |
|--------|----|--------|-----|--------|------|----|-------|------|-----------------------|
| 0.0756 | 0 | 0.3317 | 0.6 | 0.0167 | 0.39 | 18 | 0.164 | 2.24 | 0.24 |

| Variable | Description | Units | Value | <u> </u> |
|----------|--------------------------------|------------------|---------------|----------------------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| | Fraction of COC air | | constituent- | |
| Fv | concentration in vapor phase | unitless | specific | 0% for metals |
| _ | Unitized yearly average dry | | constituent- | · · · |
| ŀ | deposition from particle | | and site- | 1 |
| Dydp | phase | s/m²-уг | specific | air modeling |
| | Unitized yearly average det | | constituent- | |
| | deposition from particle | _ | and site- | |
| Dywp | phase | s/m²-yr | specific | air modeling |
| | Interception fraction of the | | | |
| Rp | edible portion of plant | unitless | 0.39 | default |
| | Fraction of COC wet | | | |
| | deposition that adheres to | | İ | value for cations and most |
| Fw | plant surfaces | unitless | 0.6 | organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| | Length of plant exposure to | • | | |
| | deposition per harvest of | | | Į į |
| Тр | edible portion of plant | yr-1 | 0.164 | recommended |
| | Yield or standing crop | | | |
| | biomass of the edible portion | |] | recommended value for |
| Yp_ | of the plant (productivity) | kg DW/m² | 2.24 | above ground produce |

Forage and Silage Concentrations Due to Air-to-Plant Transfer

| Q | Fv | Cyv | Bv _{forage} | Vg _{ag} | а | P۷ |
|--------|----|-----|----------------------|------------------|------|----|
| 0.0756 | 0 | 0 | 0 | 1 | 1200 | 0 |

| Variable | Description | Units | Value | |
|----------------------|---|-----------------------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| F∨ | Fraction of COC air concentration in vapor phase | unitless | constituent- | 0% for metals |
| Cyv | Unitized yearly average air concentration from vapor phase | μg-s/g-m ³ | constituent- and site- specific | air modeling |
| Bv _{forage} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- specific | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m³ | 1200 | |

Forage and Silage Concentrations due to Root Uptake

| Cs | Br _{forage} | Pr |
|----------|----------------------|----------|
| 66.08517 | 4.50E-02 | 2.97E+00 |

| Variable | Description | Units | Value | |
|----------------------|--|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Br _{forage} | Plant-soil bioconcentration factor for aboveground produce | unitless | constituent- specific | 4.50E-02 |

Beef Concentration due to Plant and Soil Ingestion

| | F | Qp | Р | Qs | Cs | Bs | Ba _{beef} | MF | A _{beef} |
|------------------|---|------------|--------------|-----|----|----|--------------------|----|-------------------|
| forage silage | 1 | 8.8 2.5 | 3.21 3.21 | 0.5 | 66 | 1 | 3.00E-04 | 1 | 0.02 |
| grain | 1 | 0.48 | 1.14 | | | · | 0.002-04 | • | 0.02 |

| Variable | Description | Units | Value | · · · · · · · · · · · · · · · · · · · |
|--------------------|------------------------------|-----------|-----------------|--|
| Validatio | Fration of plant type grown | Office | Value | and the second state of th |
| ĺl l | | | i 1 | assumed unless site- |
| - I | on contaminated soil and | | | specific information is |
| F | ingested by the animal | unitless | 1 1 | available |
| I | Quantity of plant type | | ł [| |
| | ingested by the animal per | kg DW | Site- and | |
| Qp | day | plant/day | plant-specific | |
| | | | constituent- | |
| N I | Concetration of COC in plant | | site- and plant | |
| P | type ingested by the animal | mg/kg DW | specific | |
| | Quantity of soil ingested by | | | |
| Qs | the animal | kg/day | 0.5 | recommended |
| | | | consituent- | |
| | Average soil concentration | mg COC/kg | and site- | |
| Cs | over exposure duration | soil | specific | |
| Bs | Soil bioavailability factor | unitless | 1 | recommended |
| | | day/kg FW | constituent- | - |
| Ba _{beef} | Biotransfer factor for beef | tissue | specific | 3.00E-04 |
| | | | constituent- | |
| MF | Metabolism factor | unitless | specific | 1 |

Air Concentration

| Q | Fv | Cyv | Сур | Ca |
|--------|----|-----|-------|-------|
| 0.0756 | 0 | 0 | 0.522 | 0.039 |

| Q | Fv | Chv | Chp | Cacute |
|--------|----|-----|-------|--------|
| 0.0756 | 0 | 0 | 0.522 | 0.039 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-----------------------|------------------|---------------|
| | COC-specific emission | i | | <u> </u> |
| Q | rate | g/s | site-specific | , |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| | Unitized yearly average | | | |
| | air concentration from | | constituent- and | l |
| Суу | vapor phase | µg-s/g-m³ | site-specific | air modeling |
| | Unitized yearly average | | | |
| | air concentration from | | constituent- and | |
| Сур | particle phase | s/m²-yr | site-specific | air modeling |
| | Unitized hourly average | | · | |
| | air concentration from | | constituent- and | |
| Chv | vapor phase | µg-s/g-m ³ | site-specific | air modeling |
| | Unitized hourly average | | | |
| 1 | air concentration from | . | constituent- and | |
| Chp | particle phase | s/m²-yr | site-specific | air modeling |

TABLE A-5
CALCULATION OF MEDIA CONCENTRATIONS AT THE LOCATION OF MAXIMUM DRY DEPOSITION WITHIN THE RESIDENTIAL/AGRICULTRURAL ZONE ASSUMING A SOIL MIXING DEPTH OF 20 CM

Soil Concentration due to Deposition

Soil Concentration Average over Exposure Duration

| coc | Ds | tD | Cs _{iD} | ks | Cs (T ₂ <td)< th=""></td)<> |
|------|-------|----|------------------|--------|--|
| Lead | 0.088 | 20 | 1.7 | 0.0023 | 53.8 |
| | | | | | |

| Variable | Decryption | Units | Value |
|----------|--|-------------------------|---------------|
| Ds | Deposition Term | mg COC/kg soil-yr | site-specific |
| tD | time period over which deposition occurs (time | | |
| <u> </u> | period of combustion) COC soil loss constant | yr | 20 |
| ks | due to all proceses | yr ⁻¹ | site-specific |

Highest Annual Average Soil Concentration

| Q | Zs | BD | Fv | Vdv | Cyv | Dywv | Dydp | Dywp | Ds |
|--------|----|-----|-----|-----|-----|------|------|-------|-------|
| 0.0756 | 20 | 1.5 | . 0 | 3 | 0 | 0 | 0.33 | 0.017 | 0.088 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-------------------------|---------------|---------------|
| | COC-specific emission | 1 | | |
| Q | rate | g/s | site-specific | |
| Zs | Soil mixing zone depth | cm | 20 | - |
| | | g soil/cm3 | | |
| BD | Soil bulk density | soil | 1.5 | default |
| | Fraction of COC air | | | |
| | concentration in vapor | İ | constituent- | |
| Fv | phase | unitless | specific | 0% for metals |
| Vdv | Dry deposition velocity | cm/s | 3 | |
| | Unitized yearly average | | constituent- | |
| | air concentration from | | and site- | |
| Cyv | vapor phase | μg-s/g-m ³ i | specific | air modeling |
| _ | Unitized yearly average | | constituent- | |
| | wet deposition from | _ | and site- | |
| Dywv | vapor phase | s/m²-yr | specific | air modeling |
| | Unitized yearly average | | constituent- | |
| | dry deposition from | _ | and site- | |
| Dydp_ | particle phase | s/m²-yr | specific | air modeling |
| <u> </u> | Unitized yearly average | | constituent- | |
| | det deposition from | i . | and site- | |
| Dywp | particle phase | s/m²-yr | specific | air modeling |

COC Soil Loss Constant

| ksg | kse | ksr | ksl | ksv | ks |
|-----|-----|--------|---------|-----|--------|
| 0 | 0 | 0.0019 | 0.00045 | 0 | 0.0023 |

| Variable | Description | Units | Value | |
|----------|---|------------------|---------------------------------------|--|
| ksg | COC loss constant due to biotic and abiotic degradation | yr-1 | constituent- specific | |
| kse | COC loss constant due to soil erosion | ∨r ⁻¹ | .0 | Default value because of soil eroding onto the Site and away from the Site |
| ksr | COC loss constant due to runoff | yr.1 | Site-specific | |
| ksl | COC loss constant due to leaching | yr ⁻¹ | constituent- and Site- specific | |
| ksv | COC loss due to volatilization | yr ⁻¹ | 0 | |

COC Loss Constant due to Runoff

| RO | SW | Zs | Kds | BD | ksr |
|----|-----|----|-----|-----|--------|
| 50 | 0.2 | 20 | 900 | 1.5 | 0.0019 |

| Variable | Description | Units | Value | |
|----------|---|-----------------------|---------------|---------|
| RÓ | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| sw | Soil volumetric water content | mL water/ cm3 soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 20 | |
| | Soil-water partition | mL water/ | constituent- | |
| Kds | coefficient | g soil | specific | 900 |
| | | g soil/cm3 | | |
| BD | Soil bulk density | soil | 1.5 | default |

COC Loss Constant due to Leaching

| Р | | RO | Ev | sw | Zs | BD | Kds | ksl |
|-----|-----|----|----|-----|----|-----|----------|---------|
| 102 | 9.5 | 51 | 48 | 0.2 | 20 | 1.5 | 9.00E+02 | 0.00045 |

| Variable | Description | Units | Value | |
|----------|---|-----------------------------------|--------------------------|---------------------------|
| Р . | average annual precipitation | cm/yr | 18.06 to 164.19 | 102 - local conditions |
| | Average annual irrigation | cm/yr | 1 to 100 | |
| RO | Average annual surface runoff from previous areas | cm/yr | Site-specific | |
| Ev | Average annual evapotranspiration | cm/yr | 35 to 100 | 48 - local conditions |
| sw | Soil volumetric water content | mL water/ cm ³ soil | 0.2 | default |
| Zs | Soil mixing zone depth | cm | 20 | |
| BD | Soil bulk density | g soil/cm ³ soil | 1.5 | default |
| Kds | Soil-water partition coefficient | mL water/ g soil | constituent- specific | 900 |

Aboveground Produce Concentration due to Direct Deposition

| Q | Fv | Dydp | Fw | Dywp | Rp | kp | Тр | Yp | Pd |
|--------|----|------|-----|-------|------|----|------|-----|----|
| 0.0756 | 0 | 0.33 | 0.6 | 0.017 | 0.39 | 18 | 0.16 | 2.2 | o |

| Variable | Description | Units | Value | |
|----------|--|------------------|---------------------------------------|--|
| Q | COC-specific emission rate | g/s | site-specific | |
| fv | Fraction of COC air concentration in vapor phase | unitless | constituent- specific | 0% for metals |
| Dydp | Unitized yearly average dry deposition from particle phase | s/m²-yr | constituent- and site- specific | air modeling |
| Dywp | Unitized yearly average det deposition from particle phase | s/m²-yr | constituent- and site- specific | air modeling |
| Rp | Interception fraction of the edible portion of plant | unitless | 0.39 | default |
| Fw | Fraction of COC wet deposition that adheres to plant surfaces | unitless | 0.6 | value for cations and most organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| Тр | Length of plant exposure to deposition per harvest of edible portion of plant | yr-1 | 0.164 | recommended |
| Υp | Yield or standing crop biomass of the edible portion of the plant (productivity) | kg DW/m² | 2.24 | recommended value for above ground produce |

Aboveground Produce Concentration Due to Air-to-Plant Transfer

| Q | Fv | Cyv | B∨ _{ag} | Vg_{ag} | a | Pv |
|--------|----|-----|------------------|-----------|------|----|
| 0.0756 | 0 | 0 | 0 | 1 | 1200 | 0 |

| Variable | Decription | Units | Value | |
|------------------|---|-----------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| Fv | Fraction of COC air concentration in vapor phase | unitless | constituent- | 0% for metals |
| Суу | Unitized yearly average air concentration from vapor phase | μg-s/g-m³ | constituent- and site- specific | air modeling |
| Bv _{ag} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- specific | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m³ | 1200 | · |

Aboveground Produce Concentration due to Root Uptake

| Cs | Br _{ag} | Pr _{ag} |
|------|------------------|------------------|
| 53.8 | 1.36E-02 | 7.31E-01 |

| Variable | Decription | Units | Value | |
|------------------|-----------------------------|-----------|--------------|----------|
| | | | consituent- | · · · |
| il i | Average soil concentration | mg COC/kg | and site- | |
| Cs | over exposure duration | soil | specific | |
| | Plant-soil bioconcentration | | | |
| | factor for aboveground | | constituent- | |
| Br _{ag} | produce | unitless | specific | 1.36E-02 |

Belowground Produce Concentration due to Root Uptake

| Cs | Br _{rootveg} | VG _{rootveg} | Pr _{bg} |
|------|-----------------------|-----------------------|------------------|
| 53.8 | 9.00E-03 | 1 | 4.84E-01 |

| Variable | Decription | Units | Value | |
|-----------------------|--|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Br _{rootveg} | Plant-soil bioconcentration factor for belowground produce | unitless | constituent- | 9.00E-03 |
| VG _{rootveg} | Empirical correction factor for belowground produce | unitless | 0.1 or 1 | 1 |

Forage and Silage Concentration due to Direct Deposition

| _ Q | Fv | Dydp | Fw | Dywp | Rp | kp | Тр | Yp | Pd (mg COC/ kg DW) |
|--------|----|------|-----|-------|------|----|------|-----|-----------------------|
| 0.0756 | 0 | 0.33 | 0.6 | 0.017 | 0.39 | 18 | 0.16 | 2.2 | 0.24 |

| Variable | Description | Units | Value | |
|----------|--|------------------|---------------------------|--|
| Q | COC-specific emission rate | g/s | site-specific | |
| _ | Fraction of COC air | | constituent- | |
| Fv | concentration in vapor phase | unitless | specific | 0% for metals |
| | Unitized yearly average dry | | constituent- | |
| Dydp | deposition from particle phase | s/m²-yr | and site- specific | air modeling |
| | Unitized yearly average det deposition from particle | | constituent- and site- | |
| Dywp | phase | s/m²-yr | specific | air modeling |
| Rp | Interception fraction of the edible portion of plant | unitless | 0.39 | default |
| Fw | Fraction of COC wet deposition that adheres to plant surfaces | unitless | 0.6 | value for cations and most organics |
| kp | Plant surface loss coefficient | yr ⁻¹ | 18 | recommended |
| Тр | Length of plant exposure to deposition per harvest of edible portion of plant | yr-1 | 0.164 | recommended |
| Yp | Yield or standing crop biomass of the edible portion of the plant (productivity) | kg DW/m² | 2.24 | recommended value for above ground produce |

Forage and Silage Concentrations Due to Air-to-Plant Transfer

| Q | ۴v | Cyv | Bv _{forage} | Vg _{ag} | а | Pν |
|--------|----|-----|----------------------|------------------|------|----|
| 0.0756 | 0 | 0 | 0 | 1 | 1200 | 0 |

| Variable | Description | Units | Value | 1 |
|----------------------|---|-----------------------|---------------------------------------|---------------|
| Q | COC-specific emission rate | g/s | site-specific | |
| F∨ | Fraction of COC air concentration in vapor phase | unitless | constituent- specific | 0% for metals |
| Суу | Unitized yearly average air concentration from vapor phase | μg-s/g-m ³ | constituent- and site- specific | air modeling |
| Bv _{forage} | COC air-to-plant biotransfer factor for aboveground produce | unitless | constituent- | 0 for metals |
| Vg _{ag} | Empirical correction factor for aboveground produce | unitless | constituent- specific | |
| а | density of air | g/m³ | 1200 | |

Forage and Silage Concentrations due to Root Uptake

| Cs | Br _{forage} | Pr |
|----------|----------------------|-----|
| 53.77246 | 4.50E-02 | 2.4 |

| Variable | Description | Units | Value | |
|----------------------|--|-------------------|--------------------------------------|----------|
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Br _{forage} | Plant-soil bioconcentration factor for aboveground produce | unitless | constituent- specific | 4.50E-02 |

Beef Concentration due to Plant and Soil Ingestion

| | F | Qp | Р | Qs | Cs | Bs | Ba _{beef} | MF | A _{beef} |
|---------------------------|-------------|--------------------|----------------------|-----|----|----|--------------------|----|-------------------|
| forage silage grain | 1 1 1 | 8.8 2.5 0.48 | 2.66 2.66 0.97 | 0.5 | 54 | 1 | 3.00E-04 | 1 | 0.02 |

| Variable | Description | Units | Value | |
|--------------------|---|---------------------|---|--|
| F | Fration of plant type grown on contaminated soil and ingested by the animal | unitless | 1 | assumed unless site- specific information is available |
| Qp | Quantity of plant type ingested by the animal per day | kg DW plant/day | Site- and plant-specific | |
| P | Concetration of COC in plant type ingested by the animal | mg/kg DW | constituent- site- and plant specific | |
| Qs | Quantity of soil ingested by the animal | kg/day | 0.5 | recommended |
| Cs | Average soil concentration over exposure duration | mg COC/kg soil | consituent- and site- specific | |
| Bs | Soil bioavailability factor | unitless | 1 | recommended |
| Ba _{beef} | Biotransfer factor for beef | day/kg FW tissue | constituent- specific | 3.00E-04 |
| MF | Metabolism factor | unitless | constituent- specific | 1 |

Air Concentration

| Q | F۷ | Cyv | Сур | Ca |
|--------|----|-----|-------|-------|
| 0.0756 | 0 | 0 | 0.522 | 0.039 |

| Q | Fv | Chv | Chp | Cacute |
|--------|----|-----|-------|--------|
| 0.0756 | 0 | 0 | 0.522 | 0.039 |

| Variable | Decription | Units | Value | |
|----------|-------------------------|-----------------------|------------------|---------------|
| | COC-specific emission | | | |
| Q | rate | g/s | site-specific | |
| | Fraction of COC air | | | |
| | concentration in vapor | | constituent- | |
| Fν | phase | unitless | specific | 0% for metals |
| | Unitized yearly average | | | |
| | air concentration from | | constituent- and | |
| Суу | vapor phase | μg-s/g-m ³ | site-specific | air modeling |
| | Unitized yearly average | | | |
| | air concentration from | _ | constituent- and | |
| Сур | particle phase | s/m²-yr | site-specific | air modeling |
| | Unitized hourly average | 1 | | |
| | air concentration from | | constituent- and | , |
| Chv_ | vapor phase | µg-s/g-m ³ | site-specific | air modeling |
| | Unitized hourly average | | - | |
| | air concentration from | | constituent- and | |
| Chp | particle phase | s/m²-yr | site-specific | air modeling |